

1. A method for reducing fringe fields from a perpendicular write head having an air bearing surface, a write pole with a length and a first width, a leading shield, and a return pole with a second width, comprising:

tapering said write pole so as to have increasing width in a direction away from the
5 air bearing surface;

symmetrically locating a trailing shield, whose bottom surface is coplanar with the air bearing surface at a first distance behind said write pole;

at second distances from opposing edges of the write pole, placing a pair of side shields that contact said trailing shield, that have bottom surfaces coplanar with the air
10 bearing surface, said side shields having opposing outer edges separated by an amount equaling said second width, whose widths exceed said the write pole length by an amount; and

magnetically connecting said side shields to said return pole.

2. The method recited in claim 1 wherein said write pole first width at the air bearing
15 surface is between about 0.05 and 0.4 microns.

3. The method recited in claim 1 wherein said return pole second width is between about 10 and 50 microns.

4. The method recited in claim 1 wherein said first distance, between write pole and

HTIRC03-014

trailing shield, is between about 0.02 and 0.2 microns.

5. The method recited in claim 1 wherein said trailing shield has a thickness between about 0.05 and 0.4 microns.

6. The method recited in claim 1 wherein the tapering of said write pole is at an angle
5 of between about 15 and 65 degrees, relative to the vertical.

7. The method recited in claim 1 wherein said tapering of the write pole begins at an edge that is closest to a trailing edge.

8. The method recited in claim 1 wherein said tapering of the write pole begins at an edge that is closest to a leading edge.

10 9. The method recited in claim 1 wherein each side shield has a width between about 0.2 and 5 microns.

10. The method recited in claim 1 wherein said second distances, between each of said side shields and said write pole, is between about 0.02 and 0.2 microns.

11. The method recited in claim 1 wherein each side shield is between about 0.05 and

HTIRC03-014

5 microns from said leading shield.

12. The method recited in claim 1 wherein each side shield has a thickness between about 0.05 and 0.4 microns.

13. The method recited in claim 1 wherein said return pole has a thickness between
5 about 0.5 and 5 microns.

14. The method recited in claim 1 wherein said write pole length is between about 0.1 and 0.5 microns.

15. The method recited in claim 1 wherein said amount by which the side shield width exceeds the write pole length is up to about 0.2 microns.

10 16. A shield for a perpendicular write head having an air bearing surface, a write pole with a length and a first width, a leading shield, and a return pole with a second width, comprising:

said write pole being tapered so that its width increases with increasing distance from the air bearing surface;

15 a trailing shield, whose bottom surface is coplanar with the air bearing surface and that has a first width, symmetrically located at a first distance behind said write pole;

HTIRC03-014

a pair of side shields, that contact said trailing shield and that have bottom surfaces coplanar with the air bearing surface, located a second distance from opposing edges of the write pole, said side shields having opposing outer edges separated by an amount equaling said second width, and widths that exceed the length of the write pole by an amount; and

said side shields being magnetically connecting to said return pole.

17. The shield described in claim 16 wherein said write pole first width at the air bearing surface is between about 0.05 and 0.4 microns.

18. The shield described in claim 16 wherein said return pole second width is between about 10 and 50 microns.

19. The shield described in claim 16 wherein said first distance, between write pole and trailing shield, is between about 0.02 and 0.2 microns.

20. The shield described in claim 16 wherein said trailing shield has a thickness between about 0.05 and 0.4 microns.

21. The shield described in claim 16 wherein the tapering of said write pole is at an angle of between about 15 and 65 degrees, relative to the vertical.

HTIRC03-014

22. The shield described in claim 16 wherein said tapering of the write pole begins at an edge that is closest to said trailing shield.

23. The shield described in claim 16 wherein said tapering of the write pole begins at an edge that is closest to the return pole.

5 24. The shield described in claim 16 wherein each side shield has a width between about 0.2 and 5 microns.

25. The shield described in claim 16 wherein said second distances, between each of said side shields and said write pole, is between about 0.02 and 0.2 microns.

10 26. The shield described in claim 16 wherein each side shield is between about 0.05 and 5 microns from said leading shield pole.

27. The shield described in claim 16 wherein each side shield has a thickness between about 0.05 and 0.4 microns.

28. The shield described in claim 16 wherein said return pole has a thickness between about 0.5 and 5 microns.

HTIRC03-014

29. The shield described in claim 16 wherein said write pole length is between about 0.1 and 0.5 microns.

30. The shield described in claim 16 wherein said amount by which the side shield width exceeds the write pole length is up to about 0.2 microns.